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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Woong Kwon

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EXAMINER

BEHNCKE, CHRISTINE M

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/763,395	Applicant(s) KWON ET AL.	
	Examiner CHRISTINE M. BEHNCKE	Art Unit 3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 13, 15, 16 and 18-23 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-10, 13, 15, 16, and 18-22 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 23 and 24 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to the Amendment and Remarks filed 26 June 2008, in which claims 1-10, 13, 15, 16, and 18-23 were presented for examination.

Response to Arguments

Applicant's arguments with respect to claims 1, 7, 13, and 21-24 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-4, 6, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jinichi, JP 2001-138272, in view of Takenaka, US 2003/0114960, and in further view of Adachi et al., "Mechanism and Control of a Leg-Wheel Hybrid Mobile Robot", Proceedings of the 1999 IEEE/RSJ, 1999 IEEE.

(Claims 1 and 23) Jinichi discloses an ambulatory robot and method including a lower body having two or more legs and an upper body part installed on an upper end of the lower body part and capable of performing positional displacement by moving the lower body part (Figures 6 and 7), the ambulatory robot comprising: rotating means installed on a bottom surface of each of the two or more legs (Figure 4); and control means for controlling a motion of the ambulatory robot using the lower and upper body parts ([0038]), wherein the control means controls a speed of revolution of the rotating means ([0040]), and controls the motion of the ambulatory robot so that the positional displacement of the ambulatory robot is performed by any of running, walking and

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sliding, depending on the controlled speed of revolution ([0073]-[0074]). Jinichi further discloses wherein the robot is able to walk up stairs, skid over floor surfaces, but does not disclose detecting the slope of a floor. However, Takenaka teaches a floor shape estimation system for a biped walking robot, including a slope-detecting means for sensing a slope of a floor, the slope of the floor being defined only directly under the two or more legs of the ambulatory robot (figures 41 and 43, [0012]-[0013]). Takenaka further teaches wherein the slope-detection means is in the two or more legs of the ambulatory robot ([0081]), the slope of the floor being determined by positioning a first leg of the ambulatory robot with a slope detection means on the floor ([0081]), and the control means being configured to control the motion and position of the second leg of the robot based on the slope of the floor ([0084], [0133]). It would have been obvious to one of ordinary skill in the art to combine the teachings of Takenaka with the invention of Jinichi because as Takenaka suggests, placing the slope detection means allows the robot to dynamically detect the surface and adjust its gait and posture to maintain stability when discontinuities in the floor can not be detected except when traversed over. Jinichi does not specify that the speed of motion of the two or more legs is based on the slope of the floor. However, Adachi et al. teaches control of a hybrid mobile robot that includes slope-detection means for sensing a slope of a floor (ultrasonic range sensor mounted on active sensor arm) and control the speed of the robot motion based on the detected slope of the floor, thereby controlling each leg based on the slope of the floor (paragraph 4.2). Adachi et al. clearly is teaching the benefits of wheels, fast and efficient on flat terrain but cannot efficiently move on discontinuous terrain, and legs that

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move inherently slower (paragraph 1, lines 15-24) even on flat terrain but can negotiate obstacles and slopes.

(Claim 2) Adachi further teaches decelerating means for slowing the speed of revolution of the rotating means, wherein the control means controls the decelerating means thereby controlling the speed of revolution of the rotating means (locking the front wheels, paragraph 3).

(Claim 3) Adachi further teaches wherein the control means controls the decelerating means so that the speed of revolution slows to zero when the slope of the floor sensed by the slope-detection means is greater than a first preset angle (paragraph 4.2).

(Claim 4) Adachi further teaches wherein the control means controls the motion of the robot so that the positional displacement of the robot is performed by walking when the speed of revolution equals zero (walking up steps, paragraph 4.2, and figure 7).

(Claim 6) Adachi and Jinichi teach wherein the rotating means comprises two or more wheels (figure 1 for Adachi, drawing 14 for Jinichi).

(Claim 24) Jinichi describes controlling the speed of rotating means to control speed of running robot and speed of the motion of the legs ([0087]-[0088]). Adachi further teaches wherein the control means is configured to control speed of running of the robot by controlling the speed of revolution of the rotating means and the speed of the motion of the two or more legs of the robot based on the slope of the floor (paragraph 4.2).

It would have been obvious to one of ordinary skill in the robotic art at the time of the invention to combine the teachings of Adachi et al. with the robot of Jinichi because, as Adachi et al. suggests, controlling the wheel speed by increasing traction by braking/locking the front wheels to increase stabilization over uneven ground (paragraphs 4.2 and 5) when the robot detects “discontinuous contact locomotion environment” by the ultrasonic range sensor (paragraph 3). Adachi teaches the detection of discontinuous ground allows the robot to effectively negotiate flat terrain quickly, and lock the front wheel to create a stable leg when moving on a steep slope to slow the descent by generating more traction.

Allowable Subject Matter

Claims 7-10, 13, 15, 16, and 18-22 are allowed.

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE M. BEHNCKE whose telephone number is (571)272-8103. The examiner can normally be reached on 8:30 am- 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Thomas G. Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. M. B./
Examiner, Art Unit 3661

/Thomas G. Black/
Supervisory Patent Examiner, Art Unit 3661